

FISCHERSCOPE® ST200

Automated Scratch Testing System for Analyzing the Adhesion and Cohesion Strength of Coatings



Description

The FISCHERSCOPE® ST200 is a progressive load scratch tester for analyzing the adhesion and cohesion strength of coatings according to ASTM C1624, ISO 20502, and DIN EN 1071-3. The instrument is perfectly suitable for measurement in development, quality assurance, incoming inspection and process control.

Typical fields of application

- Hard material coatings (PVD, CVD)
- Automotive engine and drive train components
- Electroplated coatings (decorative, functional)
- Characterisation of hard anodic coatings
- Materials used specifically in medical technology applications
- Electronic components, connectors, bond wires, etc.
- Plasma-applied coating systems

Design

Features

- Various measurement modes: constant load, progressive load, incremental load
- Three analyzing methods: optical microscopy, friction force measurement and acoustic emission measurement
- Motor driven XY-stage and Z-axis
- Measurements on curved surfaces with motion feed-back control
- Automatic image scan of the whole scratch
- Diamond indenters of various geometries
- Optical filters for contrast improvement
- Integrated electronics, no external control unit necessary
- Two microscope objectives, optional: four additional objectives
- Easy-to-use software WIN-SCU based on Windows®
- Data and image capturing over the whole scratch length
- Data storage in ASCII format
- Easy creation of test reports
- Optional: customized sample holders

General Specification

Intended use	Scratch tester instrument for characterizing hard coated materials, with a typical coating thickness exceeding 1 µm
Design	Bench top unit with PC, measuring head, positioning device made of natural hard stone, programmable XY-stage, motorised z-axis

Measuring Head

Normal load range	1 to 200 N
Load resolution	6 mN
Minimum contact load	0.5 N

Friction measurement module

Maximum load	200 N
Resolution	6 mN

Acoustic emission sensor

Resonance frequency	100 kHz $\pm$ 20 %	Maximum amplification 1,000,000 x
Dynamic range	73 dB $\pm$ 3 dB	

Microscope-/ Camera magnification

Objective	5x, 20x
Video picture (field of vision)	2688 x 2150 µm, 672 x 538 µm
Camera	Color 1280 x 1024 pixels
Light source	LED

Indenters

Design	Standard: Spherical diamond-tipped cone with 120° angle (R = 0.05 mm, 0.1 mm, 0.2 mm) others on request
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Sample Stage

Design	Programmable XY-stage, motorized z-axis
Stage dimensions	100 x 100 mm
Repeatability precision X/Y	$\leq$ 1 µm (direction-independent)
Stage speed (Scratch speed)	0.4 – 600 mm/min
Maximum travel	45 x 190 mm
Maximum specimen height	100 mm

Options

Additional microscope objectives	2.5x, 10x and 50x with video picture
Sample holders	Custom specific sample holders on request

Electrical Data

Main voltage, mains frequency	100 to 240 V $\pm$ 10 % 47 – 63 Hz
Power consumption	max. 130 W (without evaluation PC)
Protection class	IP20

Dimensions

External dimensions (Height x width x depth)	630 mm x 650 mm x 610 mm
Weight	100 kg

Environmental Conditions

Operating temperature	Climatic chamber class 3: 15 °C – 40 °C / 59 °F – 104 °F
Storage/Transport temperature	Climatic chamber class 2: -20 °C – 55 °C / -4 °F – 131 °F
Admissible air humidity	$\leq$ 80 %, non-condensing

Evaluation Unit

Software	WIN-SCU
Operating system	Windows®

Standards

CE approval	EN 55011, EN 61326, EN 61010
Standards	ASTM C1624, ISO 20502, DIN EN 1071-3

Order

FISCHERSCOPE® ST200	605-812
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